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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,581	12/29/2003	Robert E. Higashi	H0005015-1100.1237101	8573

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1795	

NOTIFICATION DATE	DELIVERY MODE
06/11/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/750,581	HIGASHI ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29,31-34,36,37,39-45,47-56,58 and 70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29,31-34,36,37,39-45,47-56,58 and 70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 14, 2010 has been entered.

2. Claims 29, 31-34, 36, 37, 39-45, 47-56, and 58-70 are pending and are rejected for the reasons given below.

Declarations

3. The first declaration, titled “Declaration Under 37 C.F.R. § 131," filed April 14, 2010 has been considered but it is not convincing.

On the front page of the affidavit, it is stated that "this Declaration is to establish *completion* of the invention …" (emphasis added by examiner). Yet, in section 5(a) of the “Invention Record,” it is stated that if no reduction to practice was made, “n/a” should be entered. In light of this, the examiner finds that the Declaration fails to establish completion of the invention since it is disclosed that no reduction to practice was made.

4. The second declaration, or supplementary declaration, filed April 14, 2010 has been considered but it is not convincing.

The declaration has not established possession of either the whole of the claimed invention or something falling within the claim, as required by MPEP 715.02.

On page 2 of "Exhibit 2," the bottom paragraph states that the PEM was Nafion™, that carbon electrodes with 0.3mg/cm2 Pt were used. However, the declaration does not anywhere disclose the following limitations of instant claims 29, 47, 54 and 63: a first aperture defined by a first aperture surface through the first electrode layer and a second aperture defined by a second aperture surface through the second electrode layer, and a proton exchange member including a catalyst. Further, the declaration does not teach the conductive adhesive of claim 29, since the electrodes of aluminized mylar are believed by the examiner to be the electrodes used to test the fuel cell.

The declaration states that the fuel cell shown in Figure 9 "was made in accordance with the invention" but not the claimed invention. Since there is no supporting evidence to show that the declaration has established possession of either the whole of the claimed invention or something falling within the claim, it is not found to be convincing in pre-dating the Leban or Blunk et al. references.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 29, 31-34, 36, 37, 39-45, 47, 48, 54-56 and 58-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leban (US 7,049,024) in view of Blunk et al. (US 6,942,941).

Regarding claim 29, Leban teaches a membrane electrode assembly including a first electrode layers having apertures, a second electrode layer having apertures, and a proton exchange membrane having catalyst on both sides of the membrane (abstract, Fig. 9). Leban further teaches that the proton exchange member is adhered to the electrodes with an adhesive film by lamination (abstract).

As for claims 31 and 32, the membrane of Leban is Nafion ®, a sulfonated polytetrafluoroethylene, and the catalyst is platinum (column 2 lines 46-50).

With further regard to claim 29 and regarding claims 33, 34, 36, 37, and 39-43, the electrodes of Leban are formed by providing electrode layers of a conductive material and depositing electrode material on the layers (column 2 lines 36-40). Thus, the entire of the electrode is conductive and in electrical contact, which one of ordinary skill in the art would recognize to be an inherent characteristic because of the need to conduct the electricity formed in the fuel cell to the applied load.

Regarding claims 61 and 62, Leban teaches a lamination process that involves only one adhesive layer (column 4 lines 46-48).

As for claim 70, it is clear that the electrodes are made of a continuous material (see Figs. 1-10).

With regard to claim 47, Leban teaches an electrode assembly but fails to teach that the electrodes are made of insulating materials with conductive coatings applied thereon.

As for claim 48, the membrane includes catalyst on both surfaces (abstract).

Regarding claim 68, one of ordinary skill in the art would realize that the anode would inherently be in communication with a fuel reservoir, since fuel cells require fuel in order to operate and since fuel would necessarily be provided in a reservoir since, unlike oxidant, it is not readily available from the atmosphere.

As for claims 54 and 63, Leban teaches the electrode assembly and lamination method, as discussed above, but fails to teach the electrodes are made of insulating materials with conductive coatings applied thereon.

With regard to claim 55, Leban teaches cutting each cell from a roll of laminated cells (column 5 lines 5-10).

As for claims 56, 58, 59 and 65, the contacts of the cells of Leban are located on the surfaces of the electrodes opposite the membrane surface (Fig. 9; column 4 lines 15-19).

Regarding claim 64, Leban teaches catalyst on both sides of the membrane (abstract).

As for claim 66, Leban teaches adhesive between the membrane and electrodes (Fig. 8).

With further regard to claim 29, and regarding claims 60 and 67, Leban fails to teach explicitly that the adhesive is conductive.

Blunk et al. teach a fuel cell using electrically conductive adhesive to bond components (abstract).

Blunk et al. further teach that the use of conductive adhesive enables current generated by the cell to be passed to the load without overheating the cell, based on the resistance of the adhesive (column 2 lines 57-67).

One of ordinary skill in the art would recognize that an electrically conducting adhesive such as the adhesive of Blunk et al. would be desirable for use in Leban, since the adhesive would allow for the electrons generated across the membrane to be transported to the electrodes, where they are collected and applied to the load.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a conductive adhesive such as the adhesive of Blunk et al. in the fuel cells of Leban in order to provide a path for the electrons generated in the membrane to be delivered to the load.

As discussed above in reference to claims 47, 54 and 63, and further regarding claims 44, 45, and 69, Leban fails to teach that the electrode is made of an insulating material with a conductive material provided on the surface, including the surface (inside walls – see Fig. 4 of instant disclosure) of the apertures.

Blunk et al. teach bipolar plates, which the examiner interprets to be the same as the electrodes of the instant invention. This interpretation is made because the bipolar plates of Blunk et al. and the electrodes of the instant invention serve the same purpose - to deliver reactants to the membrane, and to conduct electricity to the load.

Blunk et al. teach that the bipolar plates may be made entirely of conductive material, as in the case of Leban, or they may be made of conductively coated polymer plates (column 4 lines 45-67).

It would be desirable to use conductively coated polymer plates, such as those of Blunk et al., instead of entirely conductive plates, such as those of Leban, since such a substitution may result in a lighter fuel cell in the instance that the coated plates of Blunk et al. are lighter than the plates of Leban, or in a less expensive fuel cell in the instance that the materials of the plates of Blunk et al. are less expensive than those of Leban.

One of ordinary skill in the art, based on the teachings of Leban and Blunk et al., specifically Figure 4 of Blunk et al., would certainly be capable of making the electrodes having the same structure as those of Leban but with conductive coating on all exposed surfaces, including the inner walls of the apertures, based on the Blunk et al.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use conductively coated polymer plates, such as those of Blunk et al., instead of entirely conductive plates, such as those of Leban, since such a substitution may result in a lighter fuel cell in the instance that the coated plates of Blunk et al. are lighter than the plates of Leban, or in a less expensive fuel cell in the

instance that the materials of the plates of Blunk et al. are less expensive than those of Leban.

7. Claims 49-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leban in view of Blunk et al. as applied to claim 47 above, and further in view of Badding et al. (US 2002/0102450).

The teachings of Leban and Blunk et al. as discussed above are incorporated herein.

Leban in view of Blunk et al. teach a thin fuel cell but fail to teach the instantly claimed dimensions.

Badding et al. teach a fuel cell apparatus having thicknesses for various components of 0.1 to 50 microns, which is desired in order to provide a current path while overcoming the resistivity of various materials ([0052]).

It would have been desirable to create parts of the fuel cell of Leban in view of Blunk et al. as small as possible, such as in the dimensions of Badding et al., in order to create a fuel cell that was very thin but still functioned to overcome the resistivity of the materials used.

It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB). For example, in each claim the thickness is considered. Since the thickness is a result effective variable as taught by Badding et al., yet the thickness is also desirably minimized, then it would be obvious

over Leban in view of Blunk et al. in further view of Badding et al. to find the optimum thickness value.

Response to Arguments

8. Applicant's arguments filed April 14, 2010 have been fully considered but they are not persuasive.

The Declarations have been discussed above.

As to Applicant's arguments, beginning on page 11, these arguments have been previously addressed, in the Final Rejection mailed December 14, 2009.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
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aee